

ENERGY AUDIT REPORT

of

SHREE L. R. TIWARI COLLEGE OF LAW,

Shree L. R. Tiwari Educational Campus, Mira Road (East) Thane 401 107



Year: 2018-19

Prepared by:

Enrich Consultants

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REGISTRATION CERTIFICATES

Regn. No. EA-8192		No. 2942
National Productivity Council (National Certifying Agency)		
PROVISIONAL CERTIFICATE		
This is to certify that Mr. / Ms. <u>Achyut Yashavant Mehendale</u> son / daughter of Mr. <u>Yashavant</u> has passed the National Certification Examination for Energy Auditors in April - 2007, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.		
He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.		
He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.		
This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.		
Place : Chennai, India		 Controller of Examination
Date : 10 th August 2007		

BEE ENERGY AUDITOR CERTIFICATE

	
MAHARASHTRA ENERGY DEVELOPMENT AGENCY	
Maharashtra Energy Development Agency (A Government of Maharashtra undertaking) 2 nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006, Ph No: 020-26614393/266144403 Email: eee@mahaurja.com , Web: www.mahaurja.com	
ECN/2018-19/CR-05/4174	19 th September , 2018
CERTIFICATE OF REGISTRATION FOR CLASS 'A'	
We hereby certify that, the firm having following particulars is registered with MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA) under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.	
Name and Address of the firm	: Enrich Consultants Yashashree, Plot No. 26, Nirmal Bag Society, Near Muktagan English School, Parvati, Pune - 411009.
Registration Category	: Empanelled Consultant for Energy Conservation Programme
Registration Number	: MEDA/ECN/CR-05/2018-19/EA-03
<ul style="list-style-type: none">Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.This empanelment is valid till 31st March 2021 from the date of registration, to carry out energy audits under the Energy Conservation ProgrammeThe Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.	
 (Smita Kudarikar) General Manager (EC)	

MEDA EMPANELMENT CERTIFICATE

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ACKNOWLEDGEMENT

We Enrich Consultants, Pune, express our sincere gratitude to the management of Shree L. R. Tiwari College of Law, Shree L. R. Tiwari Educational Campus, Mira Road (East) Thane 401 107, for awarding us the assignment of Energy Audit of their Campus for the Year: 2018-19.

We are thankful to all Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. **Shree L. R. Tiwari College of Law, Mira Road**, consumes Energy in the form of **Electrical Energy**; used for various Electrical Equipment.

2. Present Energy Consumption & CO₂ Emission:

No	Parameter/ Value	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	33363	26.69
2	Maximum	3015	2.41
3	Minimum	2278	1.82
4	Average	2780.25	2.22

3. Energy Conservation projects already installed:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

4. Usage of Alternate Energy:

- The College has yet to install Roof Top Solar PV Plant.

5. Usage of LED Lighting:

- The Total LED Lighting Load of the College is **2.36 kW**.
- The Total Lighting Demand of the College is **2.36 kW**.
- The percentage of LED Lighting to Total Lighting Load is **100 %**.

6. Assumptions:

1. Energy Consumption is computed based on Load Utilization Factor
2. **1 kWh** of Electrical Energy releases **0.8 Kg** of **CO₂** into atmosphere

ABBREVIATIONS

LED	:	Light Emitting Diode
BEE	:	Bureau of Energy Efficiency
FTL	:	Fluorescent Tube Light
CFL	:	Compact Fluorescent Light
PV	:	Photo Voltaic
Kg	:	Kilo Gram
kWh	:	kilo-Watt Hour
CO ₂	:	Carbon Di Oxide
MT	:	Metric Ton

CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study Connected Load of the College.
2. To study Present Energy Consumption
3. To Study the present CO₂ emissions
4. To study usage of Renewable Energy
5. To study usage of LED Lighting

1.2 Table No 1: General Details of the College:

No	Head	Particulars
1	Name of College	Shree L. R. Tiwari College of Law
2	Address	Shree L. R. Tiwari Educational Campus, Mira Road (East) Thane 401 107
3	Affiliation	University of Mumbai

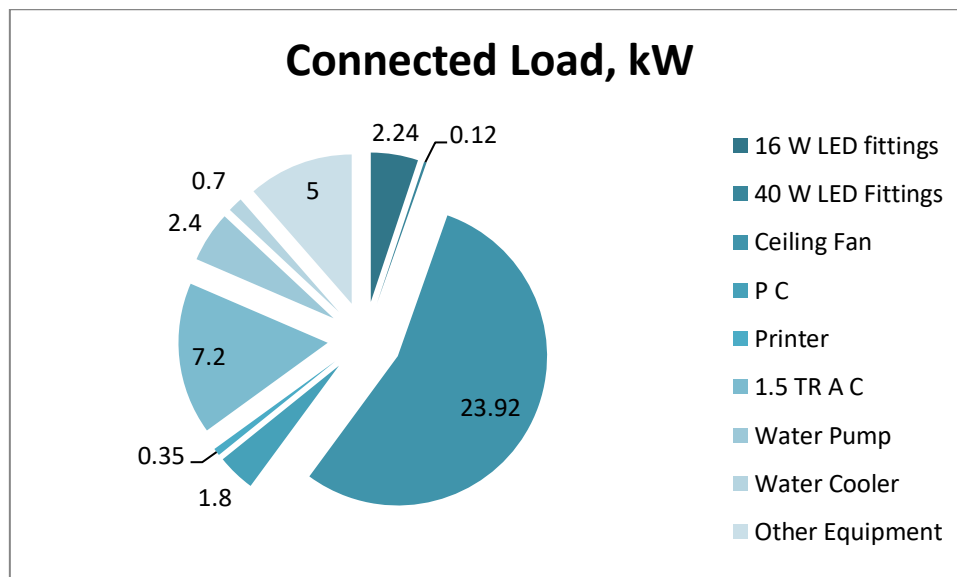
CHAPTER-II STUDY OF CONNECTED LOAD

The major contributors to the connected load of the College include:

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/unit	Load, kW
1	16 W LED fittings	140	16	2.24
2	40 W LED Fittings	3	40	0.12
3	Ceiling Fan	368	65	23.92
4	P C	12	150	1.8
5	Printer	2	175	0.35
6	1.5 TR A C	4	1800	7.2
7	Water Pump	1	2400	2.4
8	Water Cooler	2	350	0.7
9	Other Equipment	20	250	5
10	Total			43.73

Chart No 1: Study of Connected Load:



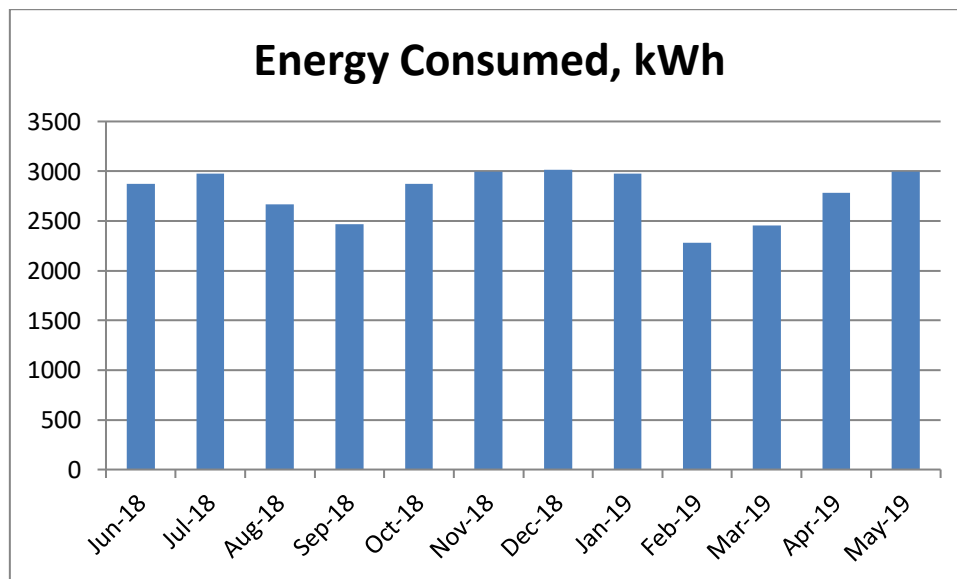
CHAPTER-III STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of Electrical Energy Consumption

Table No 3: Electrical Energy Consumption Analysis- 2018-19:

No	Month	Energy Consumed, kWh
1	Jun-18	2870
2	Jul-18	2978
3	Aug-18	2665
4	Sep-18	2469
5	Oct-18	2874
6	Nov-18	2998
7	Dec-18	3015
8	Jan-19	2978
9	Feb-19	2278
10	Mar-19	2456
11	Apr-19	2784
12	May-19	2998
13	Total	33363
14	Maximum	3015
15	Minimum	2278
16	Average	2780.25

Chart No 2: Variation in Monthly Energy Consumption:



CHAPTER-IV CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

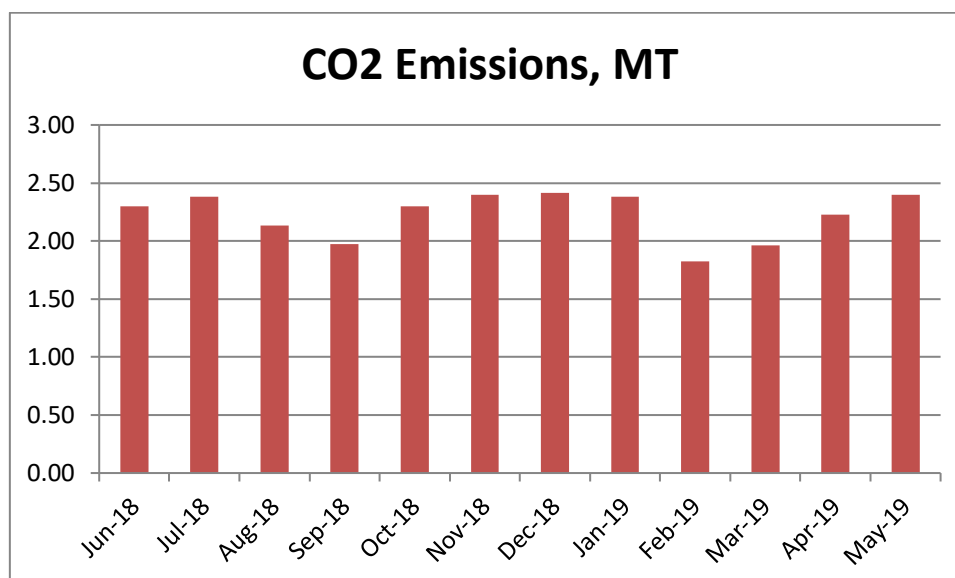
Basis for computation of CO₂ Emissions:

- 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO₂** into atmosphere

Table No 4: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Jun-18	2870	2.30
2	Jul-18	2978	2.38
3	Aug-18	2665	2.13
4	Sep-18	2469	1.98
5	Oct-18	2874	2.30
6	Nov-18	2998	2.40
7	Dec-18	3015	2.41
8	Jan-19	2978	2.38
9	Feb-19	2278	1.82
10	Mar-19	2456	1.96
11	Apr-19	2784	2.23
12	May-19	2998	2.40
13	Total	33363	26.69
14	Maximum	3015	2.41
15	Minimum	2278	1.82
16	Average	2780.25	2.22

Chart No 3: Month wise CO₂Emissions:



CHAPTER-V
STUDY OF USAGE OF ALTERNATE ENERGY

The College has yet to install Solar PV Plant

CHAPTER VI STUDY OF USAGE OF LED LIGHTING

In this chapter, we compute the percentage of usage of LEDs to Total Lighting Load.

Table No 5: Percentage of Usage of LED Lighting to Total Lighting Load:

No	Particulars	Value	Unit
1	No of 16 W LED Fittings	140	Nos
2	Load of 16 W LED Fitting	16	W/unit
3	Total Load of 16 W LED Fittings	2.24	kW
4	No of 40 W LED Fittings	3	Nos
5	Load of 40 W LED Fitting	40	W/unit
6	Total Load of 40 W LED Fittings	0.12	kW
7	Total LED Lighting Load= 3+6	2.36	kW
8	Total Lighting Load= 3+6	2.36	kW
9	% of LEDs to Total Lighting Load = $7 \times 100 / 8$	100	%